Remarks

Claims 1-19 are pending in this application. The Examiner has rejected claims 1-14 based on Sayyah et al. (U.S. Pub. No. 2003/0002099 A1). The Examiner has rejected claims 1-19 based on Farhan et al. (U.S. Patent No. 6,519,067 B2). The invention is believed to be patentable.

The invention relates to hybrid fiber coax (HFC) networks and to broadcast and narrowcast signal distribution technologies. Traditional approaches at the head end use radio frequency (RF) combining networks to combine and up convert signals. Limitations of the RF combining networks (for example, static configuration) reduce the amount of HFC network bandwidth that can be economically used.

The invention involves an improved apparatus and method for providing the HFC forward path spectrum.

Claim 1 recites an apparatus for use in a hybrid fiber coax (HFC) network to provide the HFC forward path spectrum from the head end to a network fiber node. The apparatus comprises a head end modulator directly receiving a switchable digital data signal. The head end modulator internally processes the switchable digital data signal to produce the HFC forward path spectrum that directly drives the network fiber node.

Regarding Sayyah, Sayyah describes an optical to wireless WDM converter. Sayyah describes converting optical wavelength division multiplexed channels to wireless channels. Sayyah achieves this by demultiplexing the information carrying optical carriers and extracting each optical carrier from the data utilizing an optical channelizing technique. The optical frequency of each of the extracted optical carriers is then shifted by an amount equal to the desired wireless carrier frequency in the broadband wireless channels. Optical heterodyning of the frequency-shifted extracted lightwave carriers with the original data-containing optical signals in a photodetector results in a set of wireless carriers each modulated

with the data carried by the corresponding optical channel. The overall concept is illustrated in Figure 1.

Sayyah fails to describe or suggest, as recited by claim 1, a head end modulator directly receiving a switchable digital data signal and internally processing the switchable digital data signal to produce the HFC forward path spectrum that directly drives the network fiber node. Sayyah only describes an optical to wireless WDM converter. After all, Sayyah does not even involve the production of the HFC forward path spectrum let alone suggest the claimed modulator that directly receives the switchable digital data signal and that directly drives the network fiber node.

The Examiner makes repeated reference to Figure 9 of Sayyah. Figure 9 illustrates an alternative channelizer embodiment. Figure 9 shows a channelizer comprising a slave mode-locked laser. The channelizer extracts each optical carrier from the data using an optical channelizing technique. This channelizing aspect of Sayyah does not relate to or suggest the subject matter of claim 1, and does not even involve the production of the HFC forward path spectrum, let alone suggest the claimed headed modulator that directly receives the switchable digital data signal and produces the HFC forward path spectrum that directly drives the network fiber node. Figure 9 only shows an alternative channelizer for extracting the optical carriers.

Sayyah does not teach the production of an HFC forward path spectrum, but does teach a technique to change carriers — from optical carrier to wireless carrier — without loss of coherence. In the Figure 9 channelizer, modulator 911 does not receive a switchable digital data signal and produce a HFC forward path spectrum. As well, claim 1 further recites directly driving the fiber node. In contrast, Sayyah is not about driving a fiber node, Sayyah is about switching to a wireless carrier. Coupler 160 is part of the channelizer and is not a network (distribution) node.

Claim 8 recites a method for use in a hybrid fiber coax (HFC) network to provide the HFC forward path spectrum from the head end to a network fiber node. The method comprises directly receiving a switchable digital data signal at a head end modulator. The method further comprises processing the switchable digital data signal, at the head end modulator, to produce the HFC forward path spectrum that directly drives the network fiber node. For the reasons given above, claim 8 is also believed to be patentable over Sayyah.

Claims 2-7 and 9-14 are dependent claims and are also believed to be patentable.

Regarding Farhan, Farhan also fails to suggest the claimed invention. Farhan describes a digital optical transmitter in the reverse path of a cable television system. The digital optical transmitter receives an RF signal, converts the signal to a digital signal, and adds a digital pilot tone thereto. The laser is driven to generate a digital optical signal representative of the pilot tone and the RF signal. The cable television system also includes an optical receiver for receiving the digital optical signal and recovering therefrom the RF signal and the pilot tone. The optical transmitter and receiver are coupled by fiber optic communication media.

Claim 1 specifically recites a head end modulator directly receiving a switchable digital data signal, and producing the HFC forward path spectrum that directly drives the network fiber node. The Examiner states that the claimed head end modulator is taught by Farhan. Applicants disagree. Farhan describes a digital optical transmitter for the reverse path, does not relate to producing the HFC forward path spectrum, and clearly does not describe or suggest the claimed combination of features of the head end modulator.

For the reasons given above, claims 2-14 are also believed to be patentable over Farhan.

Regarding claim 15, this claim recites a system for use in a hybrid fiber coax (HFC) network to provide the HFC forward path spectrum from the head end to a plurality of

network fiber nodes. The system comprises a plurality of head end modulators. Each modulator directly receives a switchable digital data signal and internally processes the switchable digital data signal to produce the HFC forward path spectrum that directly drives an associated network fiber node. Each individual modulator processes its received switchable digital data signal to dynamically allocate bandwidth to different services to provide an essentially narrow cast approach among the plurality of modulators.

Claim 15 is specifically directed to producing the HFC forward path spectrum. Again, Farhan describes a digital optical transmitter that is utilized in the reverse path and makes no suggestion of the claimed features.

Claims 16-19 are dependent claims are also believed to be patentable.

A check in the amount of $120 is enclosed to cover the Petition fee. Please charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,
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